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(54) LIFTING ARRANGEMENT AND LIFTING METHOD

(57) The invention relates to a lifting arrangement having a lifting device (1) which lifting device (1) is connectable to a hoist. The lifting device (1) comprises a frame (2), forks (3) as the lifting member, and a quick clamp (4). The forks (3) are attachable to the frame (2) of the lifting device (1) and detachable from the frame (2) of the lifting device (1) by means of the quick clamp (4). In addition to the forks (3), the lifting arrangement has at least one further lifting member, this at least one further lifting member also being attachable to the frame (2) of the lifting device (1) and detachable from the frame (2) of the lifting device (1) with the quick clamp (4).

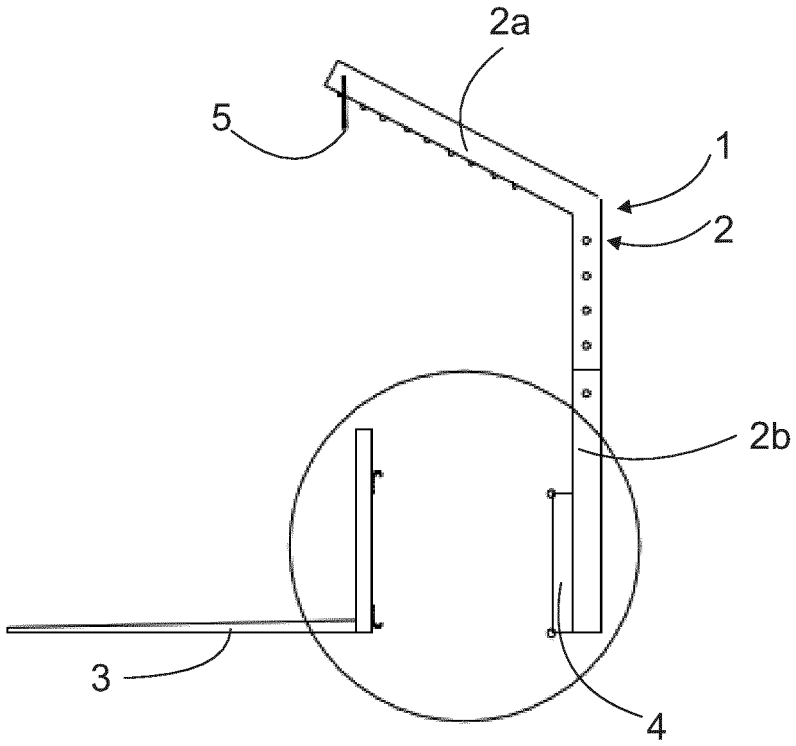

FIG. 2

EP 3 865 345 A1

Description

Background of the invention

[0001] The invention relates to a lifting arrangement and a lifting method.

[0002] In connection with a lorry, for example, a lifting device is used, by means of which the lorry's load is moved onto the bed and off the bed. The lifting device is moved with the lorry's hoist. The lifting device may have forks which are utilised when handling cargo pallets, for example.

Brief description of the invention

[0003] It is an object of the invention to achieve a new type of lifting arrangement and lifting method. The solution according to the invention is characterized by what is disclosed in the independent claims. Some embodiments of the invention are disclosed in the dependent claims.

[0004] In the disclosed solution, the lifting arrangement features a lifting device which may be hooked up to a hoist. The lifting device comprises a frame, forks as a lifting member and a quick clamp. With the quick clamp, the forks may be attached to the frame of the lifting device and detached from the frame of the lifting device. In addition to the forks, the lifting arrangement has at least one further lifting member, this at least one further lifting member also being attachable to the frame of the lifting device and detachable from the frame of the lifting device with the quick clamp in question. Such a solution is multipurpose. The lifting device may be used to handle various pieces and products without any need to make modifications to the hoist or the frame of the lifting device, or to use a different kind of hoist or lifting device for the handling. The at least one further lifting member may be one or more of the following: a bucket, grab, claws, or round bale claws.

[0005] According to an embodiment, the quick clamp is fixedly attached to the frame of the lifting device. The quick clamp may be attached to a lower part of the frame of the lifting device, and the lower part of the frame is removably fixed to another part of the frame and turnable in relation to the other part of the frame. This means that the lifting arrangement can be used in a most diverse manner. The frame of the lifting device may have a top part, oriented obliquely upwards, and the quick clamp may be oriented in the same direction as the top part of the frame when forks, for example, have been attached to the quick clamp. In such a case, the lifting device stays well balanced. When a grab or claws have been attached to the quick clamp, a bottom part of the frame may be turned in the opposite direction, in relation to the aforementioned, whereby it is easy to grasp an item from above with the grab or claws.

Brief description of the drawings

[0006] The invention is now described in closer detail in connection with some embodiments and with reference to the accompanying drawings, in which:

Figure 1 is a schematic side view of the lifting device,
Figure 2 is a schematic view of the solution according to Figure 1, with the forks detached,
Figure 3 is a schematic side view of a vehicle,
Figure 4 is a schematic side view of an enclosure for accessories,
Figure 5 is a schematic top view of the enclosure for accessories of Figure 4, and
Figure 6 is a schematic front view of the enclosure for accessories of Figure 4.

Detailed description of the invention

[0007] In Figure 1, a lifting device 1 is shown. The lifting device 1 has a frame 2, forks 3, and a quick clamp 4. The forks 3 are one example of lifting members of the disclosed lifting device 1.

[0008] The forks 3 may be attached to the frame 2 of the lifting device 1 and may also be detached from the frame 2 of the lifting device 1 by means of the quick clamp 4. The quick clamp 4 may be fixedly attached to the frame 2 of the lifting device 1.

[0009] By means of the quick clamp 4, the forks 3 or another lifting member may be detachably hooked up to the frame 2 of the lifting device 1 without using a hammer or another tool. The quick clamp 4 allows an easy and fast attachment and detachment of forks 3 or another lifting member to and from the frame 2 of the lifting device 1. The quick clamp 4 may also be referred to as a quick coupler.

[0010] In the embodiment of Figure 1, the frame 2 has a frame top part 2a and a frame bottom part 2b. The frame top part 2a has a portion oriented obliquely upwards, and a portion oriented downwards. The portion of the frame top part 2a oriented obliquely upwards may be, for example, 500 to 1000 mm long. The total height of the lifting device may be 1000 to 2000 mm, for example. At the top end of the obliquely upwards pointing portion there is a lifting loop 5. The lifting loop 5 acts as a coupling member to hook up the lifting device 1 to the hoist. The lifting loop 5 or another coupling member may also be adapted in the vicinity of a corner in the frame top part 2a, for example. The lifting loop 5 or another coupling member may also be stepwise or slidingly moved in relation to the frame top part 2a.

[0011] The frame bottom part 2b is fixed to the downward oriented part of the frame top part 2a. The frame bottom part 2b and the frame top part 2a may be connected to each other so that the parts are easy to detach from each other. The downward oriented part of the frame top part 2a and the frame bottom part 2b may be tubular parts, for example, adapted one inside another. The tu-

bular parts may be provided with holes, for example, through which a locking peg or locking pin may be adapted to interlock the tubular parts. There may be a plurality of holes in one of the tubular parts, or in both tubular parts, in the height direction whereby the height position of the frame bottom part 2b in relation to the frame top part 2a is adjustable. The tubular parts may be round or angular, such as square. Furthermore, the part to be fitted as the inner part may be a solid bar instead of having a tubular structure.

[0012] In the situation of Figure 1, the quick clamp 4 is located on the frame 2 so that it is oriented towards the obliquely upwards oriented part of the frame top part 2a. When forks 3, for example, have been attached to the frame 2, the lifting device 1, when being lifted by the hoist, stays controllably balanced.

[0013] Figure 2 shows a situation where the forks 3 are removed from the frame 2. Here, another lifting member may be put in their place. This another lifting member may be a conventional bucket, a four-action bucket, grab, claws, or round pale claws.

[0014] So, the frame bottom part 2b may be disconnected from the frame top part 2a. After detachment, the frame bottom part 2b may further be turned in relation to the frame top part 2a. In this case, the quick clamp 4 can be installed so that, for example, it is oriented away from the obliquely upwards pointing part of the frame top part 2a. Thereby a grab or claws may be connected to the quick clamp 4. Consequently, it is easy to grab a large piece from above by means of the lifting member.

[0015] If so desired, hydraulic hoses may be adapted in connection with the frame 2. The lifting device 1 may thus be used to operate lifting members requiring hydraulics. If so required, the hydraulic hoses may be attached to hose brackets adapted in connection with the frame bottom part 2b, for example.

[0016] The hoist may be a stationary hoist or a hoist adapted in connection with a vehicle. Figure 3 shows a vehicle 6, such as a lorry, having a hoist 7 connected to it. In connection with the vehicle 6, an accessories box or enclosure 8 may be adapted, where various lifting members may be placed. So, the lifting members can be stored in connection with the vehicle 6, and they can be transported with the vehicle 6. The lifting arrangement can therefore be used in diverse manners without the need to make changes in advance to the lifting device or lifting members used in connection with it.

[0017] In the embodiment of Figure 3, the accessories enclosure 8 is adapted below a cargo space 9, such as a bed. The accessories enclosure 8 forms a fixed and safe storage solution, separate from the cargo space 9, for the accessories needed for loading, lifting, and/or binding, for example. The hoist 7, for its part, is adapted between the cargo space 9 and a cabin 10 of the vehicle 6.

[0018] The structure of the accessories enclosure 8 are seen in closer detail in Figures 4, 5, and 6. The accessories enclosure 8 has two storage tubes 11. At their first ends, the storage tubes 11 are fixed to a support 12 by welding, for example. At their second ends, the storage tubes 11 may be open. In such a case, the lifting parts of the forks 3, for example, may be inserted inside the storage tubes 11 to store and transport the forks. This situation is illustrated in Figure 4. Figures 4 and 5 illustrate that a lifting device, for example, from which a lifting member has been removed, so the frame 2 of the lifting member and the quick release 4 therein may be adapted in the accessories enclosure 8 on top of the storage tubes 11.

[0019] The support 12 is adapted around a pivot pin 13. By its top end, the pivot pin 13 is fixed to a top plate 14 and, by its bottom end, to a bottom plate 15. The top plate 14 and bottom plate 15 are fixed to a fastening plate 16. The accessories enclosure 8 is fixed to the body of the vehicle 6 by means of the fastening plate 16. The fastenings may be carried out by welding, riveting, bolt/nut fastening, and/or another appropriate fastening manner.

[0020] The storage tubes 11 and support 12 may be turned around the joint 13a formed by the pivot pin 13, as illustrated in Figure 5 by the arrow A. For storage and transportation, the storage tubes 11 may be turned in the longitudinal direction of the body of the vehicle 6 and locked in place. This position may also be referred to as the transportation position. When the hoist, or another accessory, is to be brought into use, the accessories enclosure 8 is, for example, turned transverse in relation to the vehicle 6 body and locked in place. This position may also be referred to as the usage position. The accessories are then easy to take out of the accessories enclosure and use them. Once the accessories have been put into use, the accessories enclosure 8 may be turned back in the direction of the vehicle 6 body for the time they are being used. After use, operation is naturally the reverse.

[0021] In the attached drawings, the location of the pivot pin 13 and joint 13a are shown as reference, only. The pivot pin 13 and joint 13a may be located closer to the fastening plate 16 than shown in the attached drawings. The closer to the fastening plate 16 the pivot pin 13 and joint 13a are located, the less twisting and other stress will be conveyed to the structures, such as the top plate 14, bottom plate 15, and fastening plate 16. Thus, the structures may be formed simpler and lighter.

[0022] The accessories enclosure 8 is longitudinal, so the storage tubes 11 are longer than the total width of the accessories enclosure 8. The accessories enclosure 8 may also be formed without a tubular structure, that is, the accessories enclosure 8 may be box-like. Even then, the accessories enclosure 8 may be longitudinal and in the transportation position adapted to be parallel to the longitudinal direction of the vehicle 6 body.

[0023] When, for example, the forks 3 and/or lifting device is adapted in the accessories enclosure 8, as shown in Figure 4, and the accessories enclosure 8 turned in the longitudinal direction of the body 6 to the transportation position, the part of the forks 3 on the quick clamp 4

side and/or top part 2a of the body 2 of the lifting device may extend into the space between the cargo space 9 and cabin 10. They may thus be side-by-side with the hoist 7.

[0024] The accessories enclosure 8 disclosed may be used to store and transport any accessory. For example, the lifting device stored and transported in the transportation enclosure need not be provided with a quick clamp or detachable lifting members. The lifting device may therefore be a conventional lifting device that may have, for example, a fixed lifting member.

[0025] Those skilled in the art will find it obvious that, as technology advances, the basic idea of the invention may be implemented in many different ways. The invention and its embodiments are thus not restricted to the examples described above but may vary within the scope of the claims.

Claims

1. A lifting arrangement, the lifting arrangement having a lifting device (1),
the lifting device (1) having a coupling member to hook up the lifting device to a hoist,
and the lifting device (1) comprising a frame (2), as a lifting member forks (3), and a quick clamp (4) by means of which the forks (3) are attachable to the frame (2) of the lifting device (1) and detachable from the frame (2) of the lifting device (1), and
in addition to the forks (3), at least one further lifting member, this at least one further lifting member also being attachable to the frame (2) of the lifting device (1) and detachable from the frame (2) of the lifting device (1) with the quick clamp (4) in question.

2. A lifting arrangement as claimed in claim 1, wherein the at least one further lifting member is one or more of the following: conventional bucket, a four-action bucket, grab, claws, or round pale claws.

3. A lifting arrangement as claimed in claim 1 or 2, wherein the quick clamp (4) is fixedly attached to the frame (2) of the lifting device (1).

4. A lifting arrangement as claimed in claim 3, wherein the quick clamp (4) is attached to a lower part (2b) of the frame (2) of the lifting device (1), and the lower part (2b) of the frame (2) is removably fixed to the remaining part of the frame (2) and turnable in relation to the remaining part of the frame (2).

5. A lifting arrangement as claimed in any one of the preceding claims, wherein said at least one further lifting member is attachable to the frame (2) of the lifting device (1) in place of the forks (3).

6. A lifting arrangement as claimed in any one of the preceding claims, wherein the coupling member to couple the lifting device to the hoist is adapted on the top part of the frame (2) and advantageously comprises a lifting loop (5).

7. A lifting arrangement as claimed in any one of the preceding claims, wherein the lifting device is adapted in connection with a vehicle (6) which is provided with a hoist, and in connection with the vehicle (6) there is adapted an accessories box or enclosure (8) to store and transport the lifting members.

8. A lifting arrangement as claimed in claim 7, wherein the accessories box or enclosure (8) is turnable around a joint (13a) between a transportation position and usage position.

9. A lifting arrangement as claimed in claim 7 or 8, wherein there is a space in the accessories enclosure (8) for the forks (3).

10. A lifting arrangement as claimed in claim 9, wherein the space for the forks (3) is formed of storage tubes (11).

11. A lifting method, the lifting method including
lifting materials with a lifting device (1), the lifting device (1) comprising a frame (2), as a lifting member forks (3) and a quick clamp (4) by means of which the forks (3) are attachable to the frame (2) of the lifting device (1) and detachable from the frame (2) of the lifting device (1), by using the forks (3) as the lifting member,
detaching, by the quick clamp (4), the forks (3) from the frame (2) of the lifting device (1),
attaching, by the quick clamp (4), another lifting member in place of the forks (3), and
lifting materials by the lifting device (1) by using said another lifting member.

12. A method as claimed in claim 11, wherein the at least one further lifting member is one or more of the following: conventional bucket, a four-action bucket, grab, claws, or round pale claws.

13. A method as claimed in claim 11 or 12, wherein the quick clamp (4) is attached to a lower part (2b) of the frame (2) of the lifting device (1), and the lower part (2b) of the frame (2) is detached in the method from the remaining part of the body (2) and is turned in relation to the remaining part of the frame (2).

14. A method as claimed in any one of claims 11 to 13, wherein the lifting device (1) is transported by a vehicle (6) and materials are lifted onto the vehicle (6) and from the vehicle (6).

15. A method as claimed in claim 14, wherein lifting

members are transported by the vehicle (6).

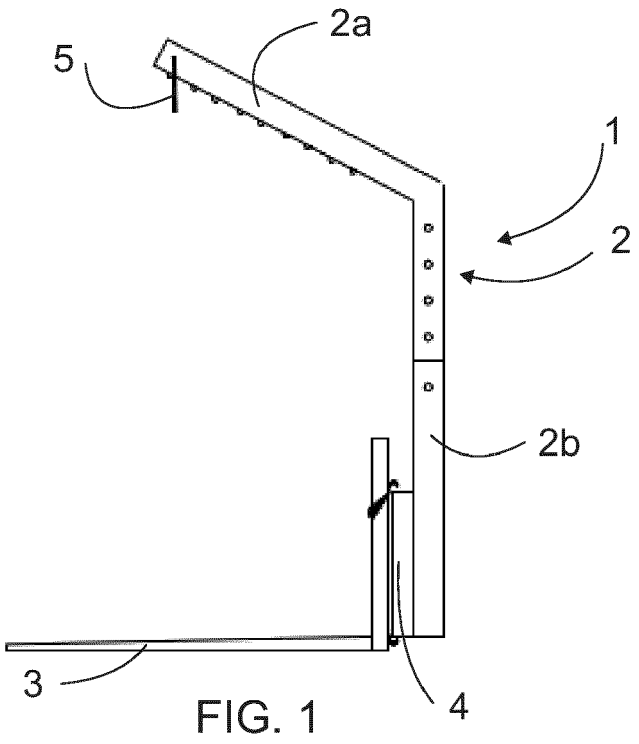

FIG. 1

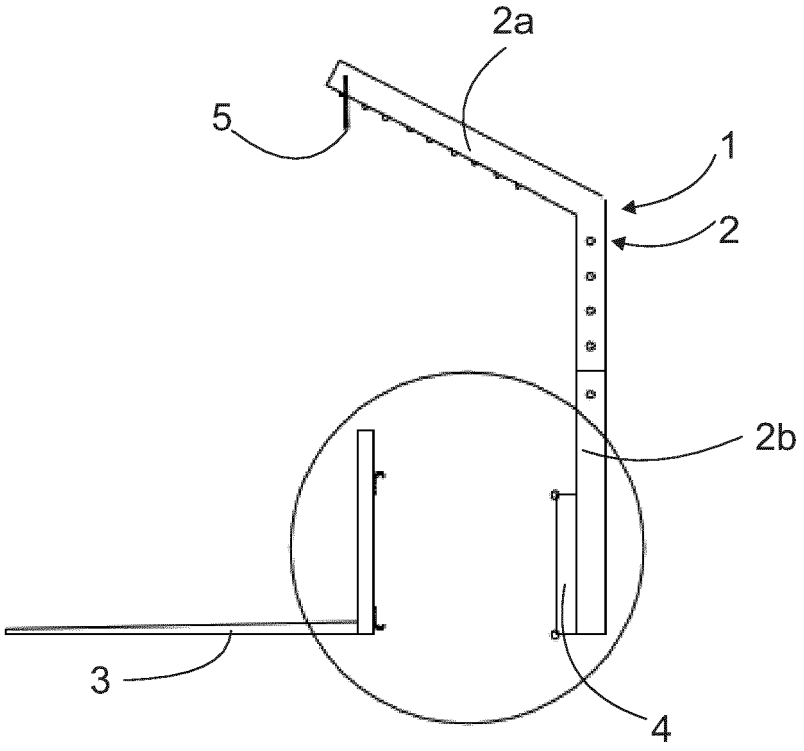

FIG. 2

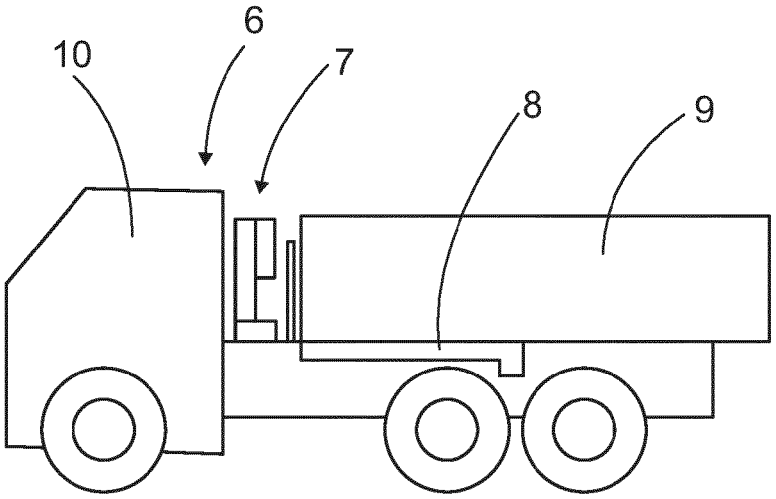

FIG. 3

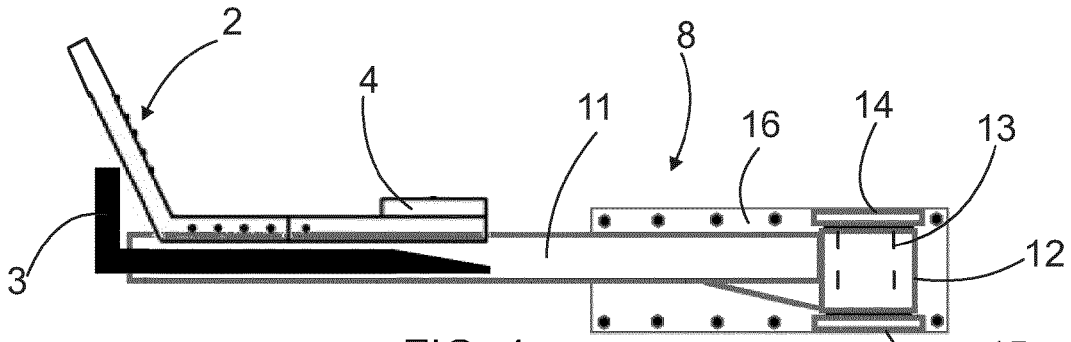

FIG. 4

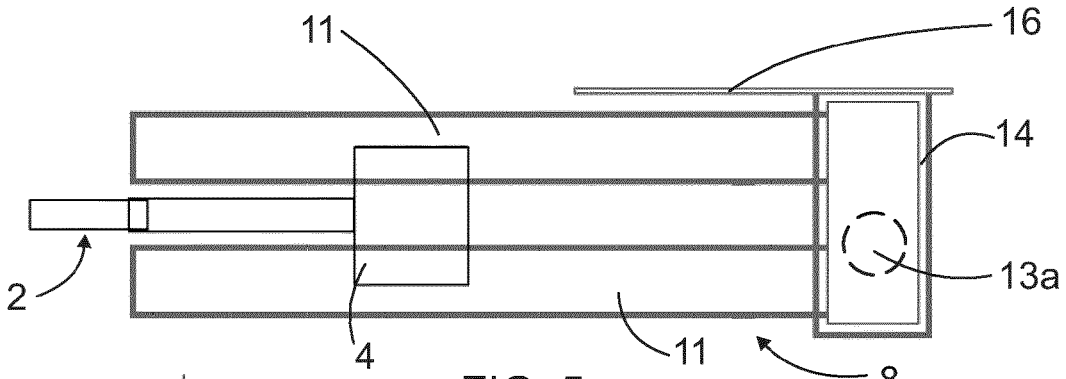

FIG. 5

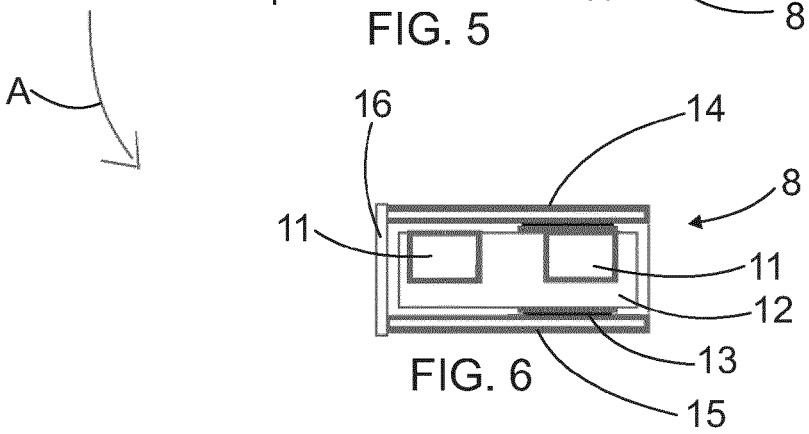

FIG. 6

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EUROPEAN SEARCH REPORT

Application Number
EP 21 15 6193

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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TECHNICAL FIELDS SEARCHED (IPC)

B66F
B66C
B60P

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	2 July 2021	Popescu, Alexandru

CATEGORY OF CITED DOCUMENTS

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